West End Farm Bill CE Proposed Action and Project Description

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Background

The project is located in Wheeler County, Oregon within portions of Township 6 South, Range 24 East, Sections 27, 28, and 33-35; Township 7 South, Range 24 East, Sections 1-5 and 7-12; Township 7 South, Range 25 East, Sections 3-6 and 8-10; Township 7 South, Range 23 East, Sections 11-14 (see attached map). The project area encompasses 14,226 acres within the Alder Creek, Buckhorn Creek, Brown Creek, and Wilson Creek 6th field watersheds on National Forest System lands 28 miles southwest of Heppner, Oregon.

The project is in an area designated in accordance with section 602(b) and (c) of the Healthy Forest Restoration Act as amended, within the Wildland Urban Interface (WUI), and/or within Condition Class 2 or 3 of Fire Regime Group I, II or III.

A historic range of variability analysis (HRV) compared the current condition of stands totaling approximately 25,000 acres in and surrounding the West End Project Area with stands in the Blue Mountains prior to Euro-American settlement and influence (prior to mid-1800's). Stands in the Dry Upland Forest and the Moist Upland Forest potential vegetation groups (PVG) are significantly departed from historical conditions in terms of species composition, stand density, and forest structure (see Tables 1-4). Ponderosa pine (*Pinus ponderosa*) cover types once dominated 50-80% of the dry upland forest (Powell 1998) but currently are found on only 46% of dry sites in the HRV analysis area (Table 1). Mid- to late seral species, such as Douglas-fir (*Pseudotsuga menziesii)* and grand fir (*Abies grandis)*, are becoming more prevalent in dry upland forests. Grand fir cover types that once represented only 10-30% of moist upland forests, have expanded to cover 70% of the moist upland forest in the HRV analysis area.

Historically, 40-85% of dry upland forests were comprised of low density stands (Table 2). Currently only 34% are low density while 50% of these stands are considered high density. Stands in moist upland forests are somewhat less dense than they were in the past.

Table 3 displays the marked reduction in stands classified as old forest single stratum (OFSS) for both dry and moist upland forest types. In contrast, old forest multi-strata (OFMS) structure has increased for both forest types. Historically, 41-80% of all dry upland forest was in old forest structure. Currently, only 21% of dry forests are in old structure. Moist forest stands are below HRV in both the stand initiation and stem exclusion structural stages (Table 4). This suggests that the lack of stand replacing disturbance events has allowed moist forests to develop into multi-storied stands dominated by grand fir, with little structural diversity across the landscape.

These conditions developed as a result of nearly 100 years of fire suppression and early twentieth-century harvest practices of taking the best trees and leaving the less desirable ones. The resultant forest stands exhibit a reduced ability to withstand attacks from endemic levels of insects and diseases. Coupled with years of extended drought, these stand conditions have led to the build-up of epidemic levels of fir engraver beetles (*Scolytus ventralis)* and building populations of mountain pine beetles (*Dendroctonus ponderosae*) (Johnson, 2019). Overcrowded stands, with abundant ladder fuels, have a reduced level of resistance to the wildfires that frequent eastern Oregon (Powell, 2017). Current fuel loads threaten values

at risk on public and private lands within and adjacent to the project area. In addition, current conditions are not conducive to the use of natural ignitions to restore fire on the landscape.

Table 1: A comparison of the historical range of variability and current conditions for species composition (forest vegetation cover types), expressed as percentages by potential vegetation group.

Forest Cover Type	Dry Upland PVG			Moist Upland PVG		
Species*	HRV (%)	Current (%)	HRV Status	HRV (%)	Current (%)	HRV Status
JUOC	0-5	0.9	within	0	0	within
PIPO	50-80	46	below	5-15	6	within
PSME	5-20	27	above	15-30	18	within
LAOC	1-10	0	below	10-30	1	below
PICO	0	0	within	25-45	4	below
PIMO3	0-5	0	within	0-5	0	within
ABGR	1-10	12	above	15-30	70	above
PIAL	0	0	within	0	0	within
ABLA/PIEN	0	0	within	1-10	1	within

*__Western juniper__ (*Juniperus occidentalis*): JUOC and mix-JUOC __Ponderosa pine__ (*Pinus ponderosa*): PIPO and mix-PIPO __Douglas-fir__ (*Pseudotsuga menziesii*): PSME and mix-PSME __Western larch__ (*Larix occidentalis*): LAOC and mix-LAOC __Lodgepole pine__ (*Pinus contorta*): PICO and mix-PICO __Western white pine__ (*Pinus monticola*): PIMO and mix-PIMO __Grand fir__ (*Abies grandis*): ABGR and mix-ABGR __Whitebark pine__ (*Pinus albicaulis*): PIAL and mix-PIAL __Subalpine fir__ (*Abies lasiocarpa*)-__Engelmann spruce__ (*Picea englemanii*)__Pinu__: ABLA, PIEN, mix-ABLA, and mix-PIEN

Table 2. A comparison of the historical range of variability and current conditions for stand density classes within potential vegetation groups.

Stand Density									
PVG	Low Density (% of stands)			Medium Density (% of stands)			High Density (% of stands)		
	HRV	Current	Status	HRV	Current	Status	HRV	Current	Status
Dry UF	40-85	34	Below	15-30	16	Within	5-15	50	Above
Moist UF	20-40	47	Above	25-60	49	Within	15-30	4	Below

Table 3. A comparison of the historical range of variability and current conditions for old forest multi-strata (OFMS) and old forest single stratum (OFSS) structural stages.

Forest Structural Stage						
PVG	OFMS			OFSS		
	HRV (% of stands)	Current (% of stands)	HRV Status (% of stands)	HRV (% of stands)	Current (% of stands)	HRV Status (% of stands)
Dry UF	1-15	21	Above	40-65	1	Below
Moist UF	15-20	64	Above	10-20	0	Below

Table 4. A comparison of the historical range of variability and current conditions for stand initiation (SI), stem exclusion (SE), and understory re-initiation (UR) structural stages.

Forest Structural Stage									
	SI			SE			UR		
PVG	HRV (% of stands)	Current (% of stands)	HRV Status	HRV (% of stands)	Current (% of stands)	HRV Status	HRV (% of stands)	Current (% of stands)	HRV Status
Dry UF	15-30	13	Below	10-20	18	Within	10-20	47	Above
Moist UF	20-30	7	Below	20-30	8	Below	15-25	22	Within

Purpose and Need

The primary purpose of the West End Project is to reduce the risk and extent of insect and disease infestations while increasing forest stand resiliency. A secondary purpose of the project is to reduce hazardous fuels. Roadside fuel treatments will contribute to improved firefighter and public safety. Fuel treatments will also enhance future opportunities to use natural wildfire to restore ecosystem health.

Proposed Action

The West End project proposes to treat stands experiencing substantial insect and disease mortality, most notably from the fir engraver epidemic, and building populations of mountain pine beetle. The project will remove trees less than 21 inches in diameter at breast height (DBH) through mechanical treatments. Treatments may include commercial thinning, non-commercial thinning, single-tree selection, seed tree, shelterwood, fuel treatments, and improvement cuts (Table 5). Understory trees may be released from the residual overstory and non-commercially thinned. Treatments will remove insect and disease affected trees and reduce stocking levels to decrease competition for soil moisture, nutrients, and light. Reducing stand densities will increase resilience to insect and disease infestation and reduce hazardous fuels.

There will be no treatments in riparian habitat conservation areas (RHCA's).

Slash created by thinning may be treated mechanically or by pile burning. Site preparation for planting will include mechanically piling slash, followed by burning piles. Tree planting may occur where a stand

is understocked, or to promote species diversity and composition that increases forest resilience to disturbance agents.

Project Design Criteria are incorporated as part of the proposed action.

Table 5. Summary of Treatments and Associated Road Work

Treatment	Total ** Acres	Harvest System	
		Tractor (acres)	Skyline/Tractor (acres)
Single-tree Selection	1,733	1028	705
Commercial Thin	220	149	71
Improvement Cut	74	74	0
Overstory Removal	100	73	27
Seed Tree with Reserves	62	62	0
Shelterwood with Reserves	33	33	0
Roadside Fuel Break	466	239	227
Roadside Fuel Break w/no harvest	16	No Harvest	No Harvest
Non-commercial Thinning	89	No Harvest	No Harvest
Slash Piling and Burning *	2791		
Site Preparation for Reforestation*	707		
Tree Planting *	707		
Total acres treated	2791	1658	1030
Maintenance Level 1 roads to be reopened/used/ put back in storage	21.5 miles		
Temp roads constructed/used/obliterated	2.4 miles		
Haul routes requiring road maintenance	66.1 miles		

*A subset of vegetation treatments that overlap with other treatment acres.

**Acreage totals are approximate, but total acres treated will not exceed 3,000

Commercial Harvest

Commercial harvest treatments will salvage trees killed by insects and disease in the project area. To reduce further build-up and dispersal of insect populations, treatments will remove trees that are infested with insects including a variety of bark beetles, tussock moth larvae (*Orgyia pseudotsugata)*, the western spruce budworm (*Choristoneura freemanii*), and the western larch case bearer (*Coleophora laricella*). Similarly, trees that are visibly infected with diseases such as dwarf mistletoe (*Arceuthobium spp*.),

Elytroderma needle cast, stem cankers (*Atropellis, Cronartium, Endocronartium*), and root disease (*Armillaria ostoyae, Phellinus weirii, Heterobasidion annosum, Phaeolus schwenitzii*) will be harvested (sanitation cuts). Trees of poor form such as those with forks, sweep, or crooks may be cut (improvement cuts). Some trees of good form and health may be removed to decrease stand densities to sustainable levels. By reducing inter-tree competition for soil moisture, individual trees have a better opportunity to produce oleoresins that help them to resist bark beetle attacks (Mike Johnson, Personal Communication).

Seral species such as ponderosa pine, western larch, and, to a lesser extent, Douglas-fir are the preferred trees for retention on dry sites. A larger component of Douglas-fir will be retained on cool, moist sites than on dry sites. At appropriate stand densities, these species are more drought and fire adapted than shade tolerant species such as grand fir. Grand fir is poorly adapted to droughty sites, reducing its ability to ward off attacks from insects and disease. Mortality from the fir engraver beetle is prevalent in both dry and cool, moist stands. The current density and composition of grand fir in stands across the moisture gradient has allowed the fir engraver population to build to epidemic proportions. All commercially valued grand fir under 21" DBH shall be removed. Resulting stand densities will range from 0-60 square feet of basal area, depending on site carrying capacity. A basal area of less than 30 square feet might occur where removal of dead or dying trees results in the creation of a small opening, typically less than 2 acres in size. These target densities may not be achievable in stands where a large component of live trees are greater than 21" DBH. Existing late old structure (LOS) will be maintained. Treatments will move many stands on a trajectory from OFMS toward OFSS structure.

All live and dead trees greater than or equal to 21-inches DBH will be retained to meet Interim Management Direction Establishing Riparian Ecosystem and Wildlife Standards for Timber Sales ("Eastside Screens"). Snags less than 21-inches DBH will be maintained at or above two snags per acre with preference given to hollow, or partially hollow, broken-top snags greater than 15-inches DBH. Wildlife corridors will retain additional down woody debris and a minimum of 15 large trees per acre to maintain wildlife habitat, cover, and connectivity.

Hand felling or mechanical felling will occur on continuous slopes less than 35%. Hand felling is required on slopes over 35%. Mechanical felling equipment is restricted to a single pass off approved skid trails (corridors). Skyline systems with one end suspension are required on all units with continuous slopes greater than 35% (approximately 1029 acres within the project area shall be harvested with a combination of tractor and skyline, Table 5). Skid trail spacing will average 100 feet. Equipment will not operate across swales, except for designated and approved crossings. Wet areas will be avoided except at approved crossings. Full suspension of logs is required over live streams in skyline units.

Non-commercial Thinning (NCT)

Stand densities will be reduced to 125-250 trees per acre (tpa) for stands where diameters typically range from 1.0-8.0 inches DBH. Prescribed stocking levels will vary based on plant associations and corresponding levels of soil depth and moisture. Species preference for leave trees are ponderosa pine and western larch on dry sites, with increasing amounts of Douglas-fir and western white pine, where present, as sites become more mesic. Historic Range of Variability analysis revealed that grand fir is currently over-represented on both dry and cool moist sites (Table 1).

Thinning will reduce competition for resources such as light, moisture and nutrients. Trees retained will respond by growing at a faster rate, moving these stands more quickly into late old structure.

Fuels Treatments

Roadside fuels reduction treatments will reduce surface fuels, ladder fuels, stand density and canopy cover, creating fuel breaks along designated roads to help stop the spread of wildfire or to contain natural ignitions and prescribed fires. Trees greater than 6" DBH will be maintained at 35 square feet of basal area, with trees below 6" DBH at stocking levels of 125 tpa. To maintain hiding cover and create wildlife visual barriers along these roads, small diameter trees will be left untreated on ½ to one acre for every 30 acres of treated stands in roadside fuel breaks.

Post-harvest or thinning slash will be treated on most sites by either mechanical or hand piling, followed by burning of piles. Slash may be lopped and scattered on sites with lighter levels of residual fuels.

Tree Planting

Tree planting may occur where stand densities fall below minimum stocking levels of 35 square feet of basal area for trees greater than 6" DBH, or 125 tpa for trees less than 6" DBH. Tree species selected for planting may be more resilient to insects and disease and better adapted to drought and fire.

Site preparation for tree planting will most often be as described above by reducing slash. On sites with heavy grass or sedge mats, mechanical treatment might include the creation of scalps using hand tools or heavy equipment such as excavator buckets. Tree planters will prepare scalps using hand tools on most sites. Scalp densities will vary from 200 to 300 24" square scalps per acre. Scalp depths will be enough to remove the crowns of grasses and sedges down to mineral soil.

Pocket gophers will be trapped and removed from sites where their population density threatens seedling survival. Pine and Douglas-fir seedlings will be protected from large ungulate browse with vexar tubes.

Literature Cited

Johnson, Michael 2019. West End Site Visit: Trip Report. Blue Mountains Forest Insect and Disease Service Center, Forest Health Protection, La Grande, Ranger District, Wallowa-Whitman National Forest, La Grande, Oregon. 12 p.

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